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Deception detection: accuracy levels among international military officers using content and contextual questioning methods

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MBA PROFESSIONAL REPORT

DECEPTION DETECTION: ACCURACY LEVELS AMONG INTERNATIONAL MILITARY OFFICERS USING CONTENT AND CONTEXTUAL QUESTIONING METHODS

December 2016

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The authors would like to acknowledge the international military officers who helped make this MBA project possible. We would also like to thank Al Scott for his assistance in participant recruitment. We also want to recognize Kris Skidmore, Paul Ortiz, Boris Kun, and Will Whaley, who were responsible for starting this project and completing the second iteration. Finally, we would like to acknowledge the countless hours of support and additional help from our advisors, Dr. Lisa Lindsey and Dr. Benjamin Roberts.

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I. INTRODUCTION

This research project is composed of two separate studies. The first study examines how contextual questioning methods are used in determining deception detection accuracy. The second study examines how people detect lies through nonverbal cues, leakage, and their experiences in social interactions. For decades, deception detection research was focused mainly on verbal and nonverbal cues to determine if someone is being deceptive. The authors acknowledge verbal and nonverbal cues are important in detecting deception; however, more recent research shows this to be the least reliable way to detect deception (Levine, Blair, and Clare, 2014; Bond and DePaulo, 2006; Park, Levine, McCornack, Morrison, and Ferrara, 2002). Recent studies have shown third-party information combined with the way questions are framed, along with verbal and nonverbal cues, provided a statistically higher probability of detecting deception. The first study asserts a combination of these procedures will result in greater accuracy in detecting deception than any one method on its own. This research project focuses on students at the Naval Postgraduate School (NPS) in Monterey, CA, to generalize previous findings to a military population compared to civilian-only population. This research project specifically examines international military officers at NPS compared to both military and civilian populations. This research project also aims to gather additional data on the use of content and contextual based questioning to determine if deception detection rates would improve.

More specifically, both studies seek to determine (1) if various questioning strategies increase international military officers' ability to accurately detect deception, and (2) how international military officers detect deception in the workplace. This is the second iteration of these studies at NPS in determining what information international military officers utilize in making their judgments of deception detection. It must be noted the method used in this research project replicated studies conducted by Park et al. (2002) and Levine et al. (2014). Using the aforementioned studies as a framework for continued research in deception detection, Study 1 evaluates how international military officers detect deception along with how accurately they performed. The authors believe

these data can aid in critical areas, such as defector interrogation and counterintelligence operations. Additionally, the authors believe the first study can be replicated recurrently to solidify assumptions made in this research project and to fine-tune the methods so future researchers can obtain higher deception detection rates.

A. BACKGROUND / PROBLEM

As illustrated before, previous deception-detection accuracy research has mainly focused on verbal and nonverbal cues. This has led to many studies focusing on the same issue without expanding on new ideas or concepts in deception detection theories. Levine et al. developed the idea of diagnostic utility in 2014 which was a new idea in the deception detection field. Levine and his colleagues had promising results increasing deception detection accuracy, which the current study seeks to replicate and expand to different populations. A previous version of this research project was conducted at NPS by Lindsey, Kun, and Whaley in 2015, which replicated Levine et al.'s findings with both U.S. and international military members. One significant drawback to the previous research at NPS was a small sample size of international military officers. The current study seeks to add to and replicate the research with international military officers. Additionally, the current study expands on research by Park et al. (2002) on how people detect lies in their day-to-day interactions. Replicating these two studies examines the degree to which previous findings can generalize to the international military community.

1. Deception Detection Accuracy

Meta-analytic results indicate these methods yield accuracy is slightly better than chance, 53.46% per Bond and DePaulo (2006). This falls in line with most law enforcement training, which focuses on "triggers" or "clusters," when individuals change their body position or twitch an eye. This can also include "grooming," in which people subconsciously clean themselves from things that are not there or touch their faces. These nonverbal actions are viewed as possible indicators a subject might be deceptive. These types of indicators are only reinforced by hit TV crime shows, which often show these behaviors as signs of deception. However, when Bond and DePaulo's (2006) findings are

observed, one can learn through the meta-analysis of 208 deception detection studies that by using nonverbal cues, deception detection accuracy is still around 50%.

The first study replicates Levine et al.'s (2014) methods but in an international military officer context. Levine et al. (2014) introduced the idea of diagnostic utility to deception detection. "Diagnostic utility is a scalable level upon which an individual uses information to form a correct conclusion" (Lindsey et al., 2015, p. 2). By using the diagnostic utility questioning method, Levine et al. was able to achieve an accuracy rate of 70%, well above the status quo of around 50%. This research project surmises that by duplicating Levine et al.'s study conducted in 2014, the results will achieve similar accuracy rates and confirm the previous studies' findings while being able to replicate similar rates with international military officers who use English as a second language.

2. How People Really Detect Lies

A key question around deception detection is how people truly detect lies in their day-to-day lives, especially in work environments. Because most of the current research has been on verbal or nonverbal cues, this was an area that was widely untouched. In 2002, Park et al. looked at how individuals determine when somebody had lied to them. Park and her colleagues found most people relied on third-party information to help them uncover deception. As a consequence, this normally delays the timeframe in which a lie is detected, which goes against the assumption people detect lies in real-time. The timeframe for deception detection ranged from months to years; an extremely small percentage of people identified the deceptive message immediately, a finding replicated by Lindsey, Dunbar, and Russell (2011) in organizational settings. Park et al.'s (2002) study found people routinely look at information provided by other individuals, the consistency of statements, and if the deceivers' statements coincided with physical evidence. Based on the previous findings of Park et al. (2002) and Lindsey et al. (2011), Study 2 examines how international military officers detect lies in their work environments.

3. The Current Studies

Study 1 is a replication of the Levine et al.'s (2014) sixth study and expands upon their research by looking at international military officers to determine if such a replication would yield the same results. The second study replicates Park et al.'s (2002) method to examine how international military officers detect lies day-to-day in the work place. These data will aid in working closely with allied partners on interrogations and counterintelligence operations. This should garner better relationships with these partners and enable the sharing of best practices in order to keep borders safe.

B. PURPOSE

The intent of this research project is to replicate prior studies in deception detection accuracy and determine how people detect lies in order to either validate or invalidate previous findings as they apply to the international military community. This is done by collecting both qualitative and quantitative data. Qualitatively, Study 1 looks into when and how deception is discovered. Quantitatively, Study 2 looks into the specific questioning methods employed and how they affect deception detection accuracy.

1. Study 1: Content and Contextual Questioning Effects on Accuracy

Study 1 aims to continue the research into diagnostic utility and how it affects the ability to accurately detect deception. By replicating Levine et al.'s 2014 study, the authors are able to show a consistent higher deception detection accuracy rating with international military officers. This should support the previous findings and show the questioning methods employed have a direct effect on deception detection accuracy.

2. Study 2: How People Really Detect Lies

Study 2 is aimed at understanding how international military officers detect lies. This research project ascertains at what point on a time scale international military officers detect deception.

C. OBJECTIVES

The objective of this research project is to provide a thorough but concise review of the current issues that have previously been identified and discussed in regard to how deception is detected. This project is not an all-inclusive research effort, but places emphasis on diagnostic utility and how individuals detect lies. Data is analyzed with the primary emphasis on deception detection accuracy using the different content-in-context approach. The first study places an emphasis on the role of the most popular, specific question strategies coupled with expertise (honing in on participants with previous experience with interviews or interrogations) and accuracy by utilizing Levine et al.'s (2014) research on diagnostic utility. Some participants have been fortunate to gain deception detection experience, whether through formal training or primary job responsibilities. Of those who have deception detection training, some also have experience and first-hand knowledge with what deceptive indicators can be comprised of. The objective of the second study strives to replicate Park et al.'s (2002) research on what types of evidence-gathering techniques participants use to determine if they have been deceived. When analyzing the second study, the authors investigate and make a determination on what methods individuals chose to use in their past experiences with deception detection.

D. RESEARCH QUESTIONS

This research project and the previous research efforts are an extension and replication of Levine et al.'s (2014) and Park et al.'s (2002) studies. The goal of the associated studies is to determine if Levine et al.'s (2014), Park et al.'s (2002), and others' results are applicable on a broader scale other than college students and law enforcement officers. The research efforts presented in this project calls attention to the useful information in determining techniques and questioning methods relevant to military operations. Specifically, this research project aims to answer the following research questions using content and contextual questioning methods (primary questions were replicated from Lindsey et al., 2015, p. 5):

1. Primary Questions

- Utilizing the diagnostic utility methods of content and contextual questioning presented in the Levine et al. (2014) study, are international military officers able to distinguish deception with greater accuracy than the previous meta-analysis mean of 54%?
- Utilizing the Park et al. (2002) method, what types of information do international military officers report using when detecting lies in the workplace?

2. Secondary Question

- Does this study replicate previous NPS findings by Lindsey, Skidmore, and Ortiz (2014) and Lindsey, Kun, and Whaley (2015)?

E. SCOPE

For Study 1, following Lindsey et al.'s (2015, p. 5) methodology, the authors analyzed "international military officers' ability to detect deception when presented with high-stakes interviews" wherein a portion of those interviewed were deceptive. Specifically, Study 1 analyzes the roles of multiple questioning strategies and how the self-assessed experts of the participants (expert versus non-expert) performed in their accuracy levels. Study 2 explores what information participants used to identify deception in past experiences, and how long it took for them to uncover the deception. This research project extends and replicates both Levine et al. (2014) and Park et al. (2002) to determine if the concepts are applicable to a different study population other than civilian sector, Study 2 focused on international military officers at NPS. Additionally, the results from Study 1 and Study 2 could be beneficial in highlighting new information regarding deception detection techniques which could aid in defector questioning and the ability to detect deception for counterintelligence operations.

F. ASSUMPTIONS AND LIMITATIONS

This section covers the assumptions made during these studies and the limitations of the research and its findings.

1. Assumptions

As explained by both Levine et al. (2014) and Bond and DePaulo (2006), the past predications of their research indicate their findings were not chance occurrences. The current research project operates on the premise that international military officers are distinct from populations used in previous research efforts. International military officers have a cultural emphasis on being truthful, and based on their respective cultures, any purposeful deception would bring an onset of stress and would be able to be observed. To bolster evidentiary findings from Study 1, Study 2 focuses on Park et al. (2002) research along with work completed by Lindsey, Skidmore, and Ortiz (2014). The main assumption in Study 2 is, as Lindsey et al. (2011) contended, "in reality, people do not discover lies for days, weeks, or even months, and deception is typically revealed by a third party, making nonverbal cues leaked during deception quite irrelevant" (Lindsey et al., 2011, p.61).

2. Limitations

For Study 1, following Lindsey et al.'s (2015, p. 6) methodology, the current research does not cover "any psychological factors such as mood, temperament, or any other conditions [that] might affect participants' responses." Also, participants in the current studies were not placed in a situation where they had to expeditiously determine the identify of deception individual allowing for additional time to observe the individuals in question. Additionally, this meant at no time the participants neither were at personal risk nor got a reward for each right or wrong assessment. No financial constraints limited the authors in their ability to collect data, as well as all participants volunteered to partake in the studies.

G. ORGANIZATION

This research project is organized into two separate studies and follows Lindsey et al.'s (2015) methodology to answer the research questions. Chapters II–V include the background history and literature review, the methodology, and the results of Study 1. Study 1 replicates the idea of diagnostic utility based on Levine et al.'s (2014) research.

Specifically, this research project wanted to analyze the role of expertise on detection deception accuracy. Chapter II is the literature review, which shows most research up until recently has focused on verbal and nonverbal indicators. Chapter III provides the methodology for Study 1, how it was set up, information on the participants, and what procedures were used. Chapter IV presents the results of Study 1. Chapter V discusses the results of Study 1 through the findings and the limitations of Study 1. Chapters VI–IX encompass Study 2. Study 2 replicates Park et al.'s (2002) research on individuals' ability to identify lies during normal, everyday activities. Chapter VI is the literature review that details what Park et al.'s (2002) research found and how people actually detect lies in their day-to-day interactions. Chapter VII provides the methodology for Study 2 which includes like Chapter III how it was set up, information on the participants, and what procedures were used. Chapter VIII shows the results of Study 2. Chapter IX discusses the results of Study 1 through the findings and the limitations of Study 2. Chapter X, is an overall summary of the conclusions as well as the authors' recommendations for further deception detection research.

II. STUDY 1: BACKGROUND HISTORY / LITERATURE REVIEW

From the beginning of when humans started interacting and communicating with one another, it can be reasonably deduced both honesty and deception have been involved in daily interactions amongst one another. Across the world, many have wished for peace, honesty, respect and the "golden rule" of treating others as you wish to be treated. Today, it is safe to say everyone wishes this would be the unwritten rule, not the exception. Regardless of why people decide to be truthful and honest with one another, the value of the techniques used to decipher when someone was being deceptive have varied over the years. According to the Intelligence Science Board (2006), this is either because the mechanism's validity drew recurrent rejection or for policy reasons. Deception antidotes such as "truth serums" were sold in the past in an effort to keep a perceived non-honest person from telling a lie. Additionally, there have been attempts to implement polygraphs into court cases as evidence when someone was suspected of being deceptive. On the other side of the spectrum, people pay to be deceived when they buy tickets to a magicians' show or when they visit a haunted house. All of these examples go to show deception has a place in daily life, whether the deception is known to the individual or not.

A. HISTORICAL BACKGROUND OF DECEPTION DETECTION

For hundreds of years, people have looked for credible ways to detect deception. Some of the earliest efforts to detect deception occurred in the Hindu and Chinese cultures. Those who were accused of lying were asked to place a grain of rice in their mouth for a short period, and then spit it out. According to research conducted by Elley (2001) in ancient China, those looking to catch a liar had the accused spit out a small serving of rice and the dry rice grains, if any when spat, would indicate the dry mouth of a liar. This method was seen as primitive and abecedarian; however, brings to light the central assumption people often make when detecting lies which is, "the psychological state of lying can be detected by the observation of physiological signs" (To, 2003). There have been three prominent physiological signs recorded that indicate when a

person is telling the truth. To further explained, “cardiovascular activity was the first sign to be associated with lying” (To, 2003). This discovery, according to research by Geddes (2002), was annotated by a famous Italian criminologist by the name of Cesare Lombroso in the late 19th century. Lombroso discovered when a subject gave untruthful answers, his or her blood pressure and heart rate would intensify. Lombroso went on to create devices such as the Plethysmograph and the Sphygmograph. To use these devices, “a subject wore airtight volumetric gloves that connected to a rubber membrane. This activated a pen that rolled over the surface of a smoked drum. The speed of the pen varied with the subject’s blood flow” (Geddes, 2002, pp. 97-100). The thought was when a person was being deceptive, “the stress of deception affected the subject’s heart rate and blood pressure. By observing the deviations traced by the pen, an investigator or observer would see when and if the subject was lying. In the 1910s, some studies suggested the ratio of time taken to inhale and exhale changed when a subject lied” (Geddes, 2002, pp. 97-100). Using this concept, coupled with Lombroso’s discovery, “John Larson invented the first polygraph in 1921 while he was a medical student working for the Berkeley Police Department” (Elley, 2001). Geddes (2002) further explained the first polygraph mapped out a subject's blood pressure and respiration at the same time. Larson's hypothesis was that abnormalities in the fluctuation of a subject’s blood pressure and breathing patterns would indicate deception. Elley (2001) added the third physiological indicator used in modern polygraphs, was termed “skin resistance” and was later added in the 1920s by Leonarde Keeler. According to To (2002), Keeler deduced a lying subject would sweat more than a truthful subject, which in turn, “would decrease skin resistance due to a higher concentration of negatively charged chloride ions on the surface of the skin” (To, 2003). When scientists learned of this, they added in this additional measurement for detecting deception and, in doing so, they hoped it would eliminate any erroneous mistakes made during the polygraph exam. Since the addition of this method to the polygraph process, no improvements or findings have been made to improve the ability or the veracity of the polygraph examination.

Previous research involving nonverbal cues indicated the reliance on nonverbal cues has resulted in accuracy rates which are not better than 50/50 or "not much different than chance" (Bond & DePaulo, 2006; Levine et al., 2014).

More recent research sought to improve human deception detection accuracy by focusing on diagnostic utility, "or the degree to which information is useful as prompted through strategic questioning" (Lindsey et al., 2014; Lindsey et al., 2015; Levine et al., 2014). For decades, deception detection research placed an emphasis on the physiological mannerisms of the subject being evaluated and the nonverbal cues were typically "indicative" of being deceptive. This research is an extension and replication of Levine et al. (2014) and Lindsey et al. (2015), based on diagnostic utility relating to deception detection. The previous studies insinuated that contextual message content consisting of plausibility associated with fact is the ultimate influence of a person's perception in deception detection.

B. REVIEW OF PREVIOUS DECEPTION DETECTION ACCURACY STUDIES

Levine et al. (2014) examined diagnostic utility and how it might play into higher deception detection rates. Levine et al. explained the manner in which "a potentially deceptive interviewee is questioned may impact veracity judgments, detection accuracy, coded verbal and nonverbal responses, or some combination of these outcomes" (Levine et al., 2014, p. 263). This research has found the manner in which a subject is questioned, especially the way questions were asked, impacted the deception detection accuracy by the investigator. Improving deception detection accuracy is ultimately the goal for law enforcement, business, or in the case of military operations, possible defector interrogations or counterintelligence operations.

The diagnostic utility approach differs from previous deception detection theories. Previous research focused on how subjects felt during questioning: the subjects' stress levels, the subjects' cognitive efforts, and subjects' ability to maintain control through questioning. The culmination of findings ultimately led to a slightly higher than chance deception detection rating. Furthermore, the other studies focused on how the investigator

viewed the subject and focused on probing effects, truth-bias, and investigator training. None of these previous studies focused on the way questions were framed and if the diagnostic utility approach could obtain better deception detection accuracy. Levine et al. (2014) pointed out "diagnostic utility also includes consideration of contextualized message content including plausibility and correspondence with known facts" (Levine et al., 2014, p. 264).

The diagnostic utility method of research requires more exploration in order to determine if Levine et al.'s findings can be replicated and extended to other populations. Levine et al.'s findings had the highest accuracy among deception detection research, and one key question regarding these and other study results centers around the role of expertise in deception detection. Levine believed "an expert's training, experience, and motivation should provide an advantage over the typical college student untrained in the specific context or any context" (Levine et al., 2014, p. 266). This would become apparent when comparing experts (those who have received formal interrogation/interviewing training) and non-experts' deception judgments. Levine et al.'s study found on the third set of questions students were actually more accurate than experts (see Table 1).

Table 1. Deception Detection Accuracy Rates. Adapted from Levine et al. (2014).

	Set one	Set two	Set three
Experts	29.2%	64.3%	72.4%
Non-experts	39.2%	66.6%	72.9%

The previous iteration of this research project found experts had a higher deception detection rate over students. Table 2 shows the findings from Lindsey et al. (2015).

Table 2. Deception Detection Accuracy Rates. Adapted from Lindsey et al. (2015).

	Set one	Set two	Set three
Experts	31.3%	54.2%	70.8%
Non-experts	36.2%	50.0%	63.8%

The findings on deception detection between experts and non-experts varied for Lindsey et al. (2015) and Levine et al. (2014). The results of Study 1 shed additional light on deception detection rates between experts and non-experts.

C. STUDY DESIGN

Study 1 design replicates the methodology employed by Lindsey et al. (2015):

> Study 1 was a 3x2 mixed design with the three sets of questions (presented in Table 6) as a repeated factor, the two levels of expertise (expert versus non-expert) as an independent groups variable, and detection accuracy as the dependent variable. Expertise was operationally defined using participants' answers to the following question: "Have you ever conducted interviewing or interrogation as a regular part of your job?" Participants who answered "No" were coded as non-expert; those who answered "Yes" were coded as experts. An additional question asked "Have you ever received formal interviewing or interrogation training?" wherein only 25% of participants had received such training; therefore, the sample size was too small to make meaningful comparisons in the current study using this question as a proxy for expertise. Participant answers (their truth/lie judgments) were scored for accuracy by adding the number of correct judgments and dividing by the total number of judgments.
>
> Each participant watched and rated 12 videotaped interviews of different students denying cheating. The 12 interviews used for this research were the same interviews that were used in Levine et al.'s (2014) sixth study. For each of the question sets, two dishonest interview segments were shown. For each deceptive interview, a corresponding honest interview was selected by matching the sex, race, and approximate physical appearance of the interviewee. Thus, there were two honest non-cheaters and two lying cheaters, all of whom denied cheating, interviewed with each of the three question sets (Lindsey et al., 2015, pp. 10-11).

D. RATIONALE FOR STUDYING DECEPTION DETECTION ACCURACY OF INTERNATIONAL MILITARY OFFICERS

The author's chose to study international military officers because these men and women have myriad areas of expertise and specialties, some of which include intelligence and counter-intelligence. International military officers originate from cultural or ethnic environments different from those found in the United States, which is often overlooked. The relevancy of detecting deception is practical in normal day-to-day activities. As representatives of the government, military members are often held to a higher standard of conduct. The expected behavior from military members encompasses making sound decisions based on their morals and ethics, which in turn, strengthens an observer's truth bias and the willingness to accept more daily communication from the military as truth opposed to deception. In the military, integrity and honor are the biggest drivers for behavior both on and off duty. Both military and civilians assume military members can be trusted more than civilians due to the rigidity and discipline acquired from military training. However, the question here is not whom one can trust more, but how accurate international military officers are at detecting deception. When dealing with international military officers, it is important to consider cultural differences dictate their behavior within their specific set of morals. However, the way deception can be detected may or may not be uniform across these different cultures; this is what Study 1 revalidates. In addition, while some specialties in the military provide training and education on how to detect deception, it would be interesting to investigate the quality and breadth of the training received amongst international military officers. Although the training international military officers receive may differentiate in quality compared to the training received by U.S. military officers, this can be an additional research topic for further study. This project seeks to discover whether international military officers' performance in deception detection translates into a qualitative and quantitative product consisting of probative information.

The research conducted by Buller, Burgoon, Buslig, and Roiger (1998) titled *Interpersonal Deception Theory: Examining Deception from a Communication Perspective,* is the academic vehicle used for the basis of this research and acts as a segue

between deception detection and the various military communities. In this four-year project, the report examined the behavior of gathering intelligence and explored how observers detect deception in various environments and whether or not they were in an academic, scientific, or other abnormal behavior inducing setting. Regardless of setting, Buller et al. (1998) further stated, as indicated by the "Interpersonal Deception Theory (IDT), deception is a communicative event, rather than a psychological phenomenon" (Buller et al.,1998, p. ii). It is in the U.S. military's interest to learn deception detection best practices from experienced international military officers. The learning which would transpire between domestic and international militaries would bolster alliances and build trust and transparency in future allied operations.

Other rationale for accounting for the abilities of international military officers was based on research conducted by Cheng and Broadhurst (2005) in their publication "The Detection of Deception: The Effects of First and Second Language on Lie Detection Ability." This work explains how language barriers can sway observers' ability to detect deception. This experiment demonstrates observers possess the ability to detect deception better when presented material in their secondary language versus their primary language. This experiment also highlights it is difficult to determine whether subjects are being truthful when they use a second language versus their primary language. The research gathered in this project relies on deception detection in the participants' second language (English); however, caution is advised, as the participants' ability to detect deception in their first language may be different when compared to the previous deception detection accuracy research by Lindsey et al. (2014) and Lindsey et al. (2015).

E. RESEARCH QUESTIONS

Since this research is an extension of the previously mentioned works, the research questions were adopted verbatim from research conducted by Lindsey et al. 2015.

> Study 1 is based on the qualitative replication of the methodology used in Levine et al. (2014). Utilizing the diagnostic utility methods of content and contextual questioning presented in the Levine et al. (2014) study, are international military officers able to distinguish deception with greater

accuracy than the previous meta-analysis mean of 54% and, if so, to what degree?

If the study holds true to the findings of Levine et al. (2014), then the authors should find a mean accuracy in excess of 54% and improvement most likely greater than 70%, with a corresponding minimal effect for expert judgments. Should the replication prove false, further research will be required to examine which portion of the study does not hold true in the chosen sample and to what amount modification will need to occur. The next chapter fully details the methodology used in Study 1. (Lindsey et al., 2015, p. 12).

III. STUDY 1: METHODOLOGY

This study is a replication of previous work and a follow-on to Lindsey et al. (2015) designed to increase sample sizes, in order to allow for statistically valid conclusions. Because the current study collected participant data in an identical manner to Lindsey et al. (2015) and because study methodology must be reported precisely and specifically, this chapter presents the same methodological information as Lindsey et al. (2015) adapted and updated to reflect the current study's specific participant data:

> In order to replicate the sixth experiment in Levine et al. (2014) in an appropriately clinical method, the authors first sought approval of NPS's Institutional Review Board (IRB) for the Protection of Human Subjects. The authors completed the mandated IRB ethically-based training and all additional reviews and subsequently received approval to initiate research. All research occurred on campus in specially designated rooms designed to best replicate the atmosphere of the initial study. Daily findings and survey materials were maintained under secure conditions, no personally identifiable information (PII) was collected, and no leakage of demographics occurred. (Lindsey et al., 2015, p. 13)

A. PARTICIPANTS

The framework for describing the participants has been replicated from Lindsey et al. (2015), while figures specific to this study have been inserted to reflect current work:

> The participants were 52 international military officers studying in resident programs at NPS. Tables 3, 4, and 5 summarize each participant's country, rank, and branch of service, respectively. Participants' ages ranged from 25-45 (Mean [M] = 35.31, Standard Deviation [SD] = 5.20) and years of military service ranged from 3-25 (M = 15.12, SD = 6.20). The volunteer participants represented a total of 23 countries (see Table 3 and Figure 1). Due to a low sample size and some countries and regions being represented by only one participant, a comparative analysis based on language, behavioral, and cultural norms was not able to be conducted. Also, 84.6% were male, 71.2% identified themselves as Caucasian/White, 21.2% identified themselves as Asian/Pacific Islander, 5.8% identified themselves as Hispanic/Latino(a), and 5.8% identified themselves as African/Black. In terms of expertise, 25% indicated they had received formal interviewing or interrogation training, and 28.8% reported that they had conducted interviewing or interrogation as a regular part of their jobs. All participants volunteered their participation, and none received any

form of compensation for their involvement in this research. Participation was anonymous, with the only demographic information collected being country of origin, gender, age, race, rank, (see Table 4 and Figure 2), years of military service, military branch, (see Table 5 and Figure 3), and level/use of interrogation training. (Lindsey et al., 2015, p. 13)

Table 3. Participants' Country of Origin

	Frequency	Percent
Ukraine	5	9.6
Brazil	3	5.8
Greece	1	1.9
Australia	7	13.5
Norway	2	3.8
Columbia	1	1.9
Singapore	3	5.8
Japan	1	1.9
Turkey	10	19.2
Germany	2	3.8
Bulgaria	1	1.9
Sweden	1	1.9
Chile	1	1.9
Romania	2	3.8
Netherlands	1	1.9
Indonesia	2	3.8
El Salvador	1	1.9
Switzerland	1	1.9
Pakistan	3	5.8
Mongolia	1	1.9
Canada	1	1.9
Mali	1	1.9
Sri Lanka	1	1.9
Total	52	100.0

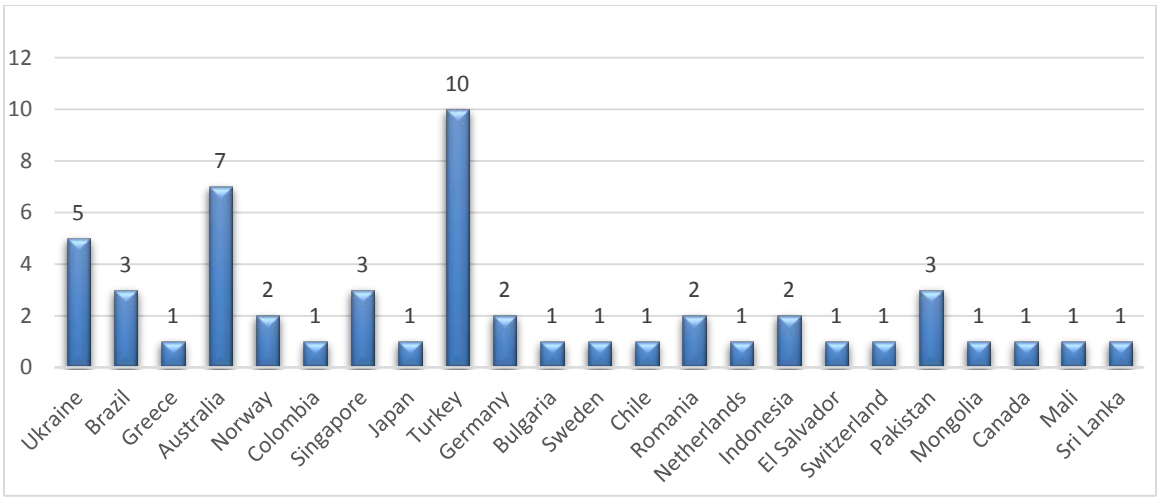
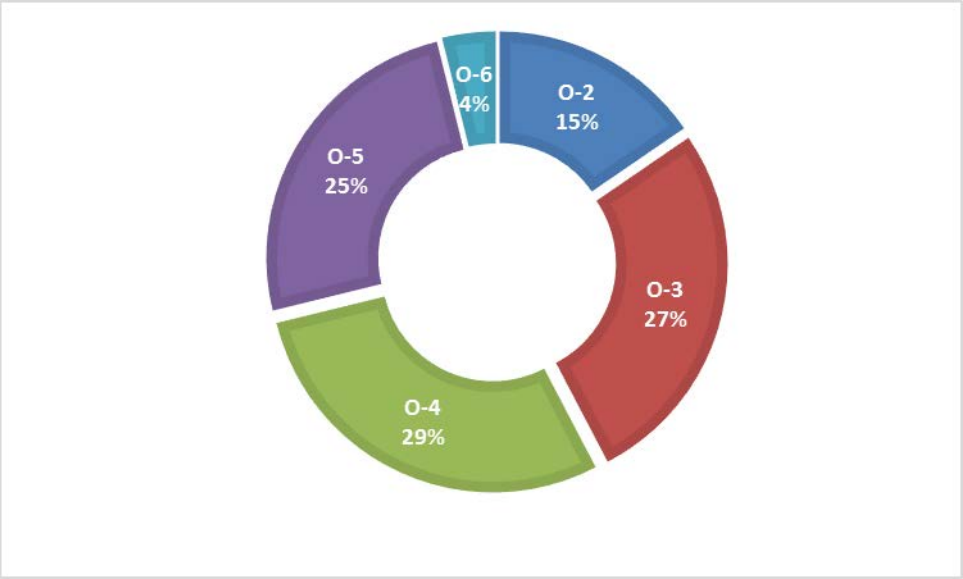


Figure 1. Participants' Country of Origin

Table 4. Participants' Military Rank

	Frequency	Percent
O2	8	15.4
O3	14	26.9
O4	15	28.8
O5	13	25.0
O6	2	3.8
Total	52	100.0



Note. Rank was operationalized using U.S. equivalent ranks.

Figure 2. Participants' Military Rank

Table 5. Participants' Branch of Service

	Frequency	Percent
Army	32	61.5
Navy	13	25.0
Air Force	6	11.5
Marines	1	1.9
Total	52	100.0

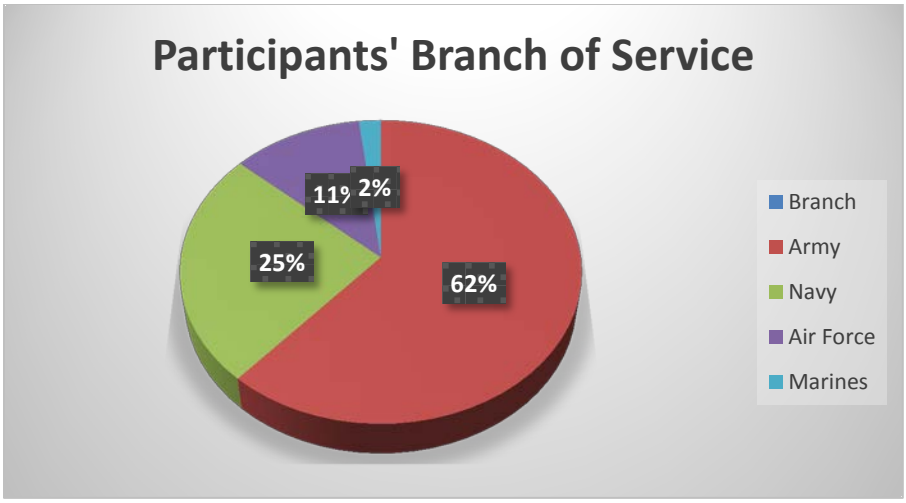


Figure 3. Participants' Branch of Service

B. MATERIALS

The framework for describing the materials has been replicated from Lindsey et al. (2015) to ensure accuracy and continuity; for the same reasons Table 6 has been replicated as well:

> The experimental stimuli in this research are twelve videotaped interview segments—all used in the sixth study of Levine et al. (2014) on diagnostic utility and expertise. Each segment showed a university student being interviewed about cheating in a research-related trivia game. All students in the 12 segments denied cheating, but half (six) actually cheated. Thus, the 12 video segments resulted in six honest students telling the truth (they denied cheating and they, in fact, did not cheat), and six dishonest students lying (they cheated, but they denied it in the interview). See Levine et al. (2014, pp. 270–272) for a detailed description of how the experimental videotapes were created. The 12 interview segments represented three different diagnostic utility questioning strategies (see Table 6). (Lindsey et al., 2015, p. 15)

Table 6. Questions Asked in the Three Sets of Cheating Tapes.
Source: Levine et al. (2014, p. 268).

First Question Set
1. Did you find the trivia questions difficult?
2. Was team work much of a factor? How so, please explain.
3. In looking at your score, you did better than other groups. Does this surprise you?
4. How would you explain your success?
5. Did cheating occur when I left the room?
6. Why should I believe you?
Second Question Set
1. How much experience have you had working in teams?
2. Have you played trivial pursuit games before?
3. How often do you play? [follow-up] Why do you/ don't you play them much?
4. In the current game, did you find the questions difficult? [follow-up] If you were going to scale it on a scale of 1 to 10, what would you say they were in terms of difficulty?
5. Was teamwork much of a factor in your performance?
6. What would you say if I told you that you did better than other groups?
7. How would you explain your performance?
8. Did you cheat when the experimenter left the room?
9. Are you telling me the truth?
10. What would your partner say if I asked them the same question?
Third Question Set
1. Tell me, in as much detail as you can, what happened during the trivia game?
2. How well did you do on in the trivia game?
3. Which questions did you and your partner get right?
4. For the answers you got right, explain how you knew the right answer?
5. In detail, what happened when the experimenter left the room?
6. Did any cheating occur?
7. When I interview your partner, what will they say about cheating?
8. Did you and your partner discuss cheating?
9. If someone did cheat, what should happen to them?

C. PROCEDURE

The procedures followed were identical to the procedures used by Lindsey et al. (2015):

> Participants entered a lab setting at which point they read and completed a consent document. After consenting to participate, each respondent individually watched a series of 12 videotaped interview segments lasting approximately two minutes apiece. After each segment, the participant paused the video for as long as necessary to make a truth/lie judgment regarding the individual in the video (see Appendix for full questionnaire for Studies 1 and 2). Participants also answered a series of demographic questions. (Lindsey et al., 2015, p. 16)

D. DATA ANALYSIS APPROACH

Following upon Lindsey et al. (2015, p. 16), "data was analyzed using mixed-model multivariate analysis of variance where question strategy was the repeated factor and expertise was the between factor, with accuracy as the dependent variable. Effect sizes were also reported."

Most of the observed population identified as Caucasian/White; this corresponds with NPS's latest ethnicity/race demographics report from 2013 (Naval Postgraduate School Center for Excellence, 2013). Similar to the findings of Lindsey et al. (2015), small group sizes for races other than Caucasian/White did not allow for statistical analysis between groups. As with race/ethnicity, participants' gender was also in keeping with the aforementioned demographics report.

"The sample was comprised of a diverse range of military ranks centered predominately on mid-career officers (O-3 through O-5) and also included some O–2 and O–6 officers" (Lindsey et al., 2015, p. 18), which aligns with the overall demographics of the school (Naval Postgraduate School Center for Excellence, 2013). This could be because countries want to make sure their service members are committed to the military before sending them to NPS, resulting in primarily seasoned officers attending the school.

The sample contained an assortment of military branches, though the majority of participants served in the Army. This loosely followed NPS's represented population (Naval Postgraduate School Center for Excellence, 2013).

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IV. STUDY 1: RESULTS

This study is a replication of previous work and a follow-on to Lindsey et al. (2015). The statistical analyses required to answer the current research questions are identical to Lindsey et al. (2015). Because statistical analyses are very specific and must be reported with precision, this chapter presents the same statistical analytic information as Lindsey et al. (2015), replicated and updated to reflect the current study's data and results:

> The data were analyzed with a 3x2 mixed analysis of variance with the three question sets as a repeated factor, the two levels of expertise (expert versus non-expert, n = 15 and n = 37, respectively) as an independent groups variable, and detection accuracy (percent correct) as the dependent variable.
>
> Consistent with Levine et al. (2014), Study 1 replicated the strong main effect for questioning strategy, $F(2, 100) = 17.42$, $p < .001$, $\eta^2 = .26$, but not a main effect for expertise, $F(1, 50) = 0.562$, $p = .46$. One should note that the main effect for expertise found by Levine et al. was trivial ($\eta^2 = .01$). Although Levine et al. found a statistically significant question type x expertise interaction, the current study did not (the effect size for Levine et al.'s interaction finding was small, with $\eta^2 = .01$). Specifically, the question by expertise interaction in the current study was not statistically significant, $F(2, 100) = 0.28$, $p = 0.75$.
>
> The cell means are presented in Table 7. Across experts and non-experts, accuracy was 35.7% (95% CI = ± 4.0%), 54.7% (95% CI = ± 4.5%), and 69.8% (95% CI = ± 3.3%) for question sets 1, 2, and 3, respectively. Accuracy means in the question set 1 and question set 3 cells were significantly different from the 54% meta-analysis mean at $p < .01$. Accuracy means for question set 2 were not significantly different from the meta-analytic mean of 54%. (Lindsey et al., 2015, pp. 21-22)

Table 7. Mean Accuracy (and Standard Deviations) by Condition, Study 1

Question Set	**Set One**	**Set Two**	**Set Three**
Expert	35.0% (20.7%)	56.7% (22.1%)	73.3% (24.0%)
Non-expert	36.5% (28.0%)	52.7% (31.6%)	66.2% (20.6%)

The data were further analyzed using a 3x2 mixed analysis of variance with the three question sets as a repeated factor, two levels of training (whether or not participants had ever received formal interviewing and interrogation training; n = 13 and n = 39, respectively) as the independent groups variable, and detection accuracy (percent correct) as the dependent variable.

Consistent with Study 1's previous results, Levine et al.'s (2014) findings were replicated such that a strong main effect was observed for questioning strategy, $F(2, 100) = 14.91$, $p < .001$, $\eta^2 = .23$, but was not their main effect for training, though it approached significance, $F(1, 50) = 3.31$, $p = .08$. The question by training interaction was not statistically significant, $F(2, 100) = 0.28$, $p = 0.75$.

The cell means are presented in Table 8. Across trained and untrained participants, accuracy was 34.3% (95% CI = ± 4.2%), 50.1% (95% CI = ± 4.6%), and 67.3% (95% CI = ± 3.5%) for question sets 1, 2, and 3, respectively. Accuracy means in all but one cell was significantly different from the 54% meta-analysis mean at $p < .01$. Accuracy means for question set 2 with no formal training were consistent with the meta-analytic mean of 54%. (Lindsey et al., 2015, pp. 21-22)

Table 8. Mean Accuracy (and Standard Deviations) by Condition, Study 1

Question Set	**Set One**	**Set Two**	**Set Three**
Formal Training	30.8% (23.2%)	44.2% (20.8%)	65.4% (28.0%)
No Formal Training	37.8% (26.8%)	57.1% (30.9%)	69.2% (19.4%)

V. STUDY 1: DISCUSSION, FINDINGS, LIMITATIONS AND RECOMMENDATIONS BASED ON ANALYSIS

The results of study 1 replicated the research of Levine et al. (2014) and Lindsey et al. (2015) and showed an increased mean accuracy rate by question set as the question sets increased in utility of content and context. The increased accuracy rate not only leads one to see the importance of content and contextual questioning methods, but also validates the previous results.

A. DISCUSSION AND FINDINGS

The findings of Study 1 bring out three prominent discussion points. First, participants who had no formal training did better in all question sets compared to participants who had formal training, although this finding was not statistically significant. This means people who had no training whatsoever did better than those who had training. This finding could be due in part to the quality of their training. Most training people receive is in person, however, the issue lies in honing in on the wrong predictors, specifically nonverbal cues. This will lead an observer to pay more attention to what the subject is conveying through body language rather than what is actively being said. Additionally, truth-biases can develop or intensify with familiarities seen in others, especially when interviewers or observers were suspicious as seen in Buller et al.'s (1998) report. Also, if a subject spoke with conviction, a truth-bias was also developed, as witnessed in further research conducted by Buller et al. (1998), which could potentially mislead an observer into thinking someone was being truthful, when in fact they were being deceptive. A lie-bias could also be developed by an observer who has had formal training, per Buller et al. (1998) studies, which indicate an observer could already be suspicious of deceptive behavior from a subject being interviewed.

Second, participants who are considered experts performed better than Levine et al.'s (2014) findings, although it was not statically significant. Third, the mean accuracy rate was shown to improve with each question set, thus bolstering Levine et al.'s (2014) theory of utility in content and contextual questioning methods. This further illustrates

the questioning method is more important than over any training someone might have received. By replicating Levine et al. (2014) with international military officers, Levine et al.'s (2014) findings have more credence because the results span multiple cultures. Based on the findings across cultures, the U.S. military can establish common ground on how to work with our partners in conducting defector interrogations as well as counterintelligence operations.

The researchers' replication of Levine et al.'s (2014, p. 23) "content and contextual questioning methods demonstrated an increase in expert participant's accuracy to 73.3% and non-expert participant to 66.2%". The expert accuracy rate of 73.3% was higher than Levine et al. (2014) as seen in Table 1 and Lindsey et al. (2015), (see Table 2), but not as high as Lindsey et al. (2014), (see Table 9). These findings in Study 1 also easily outperform Bond and DePaulo's (2006) finding of a mean accuracy rate of 54%. As for the participants with no formal training out-performing the experts, there are some theories in Buller et al.'s (1998) report which support truth basis, honesty effect, and probing effect which may help explain this finding. The importance of these numbers show even though someone is considered an expert, they may not be getting the highest deception detection rate. The main linkage to deception detection is the question method chosen to be employed. By using diagnostic utility both experts and non-experts get much higher deception detection rate. This is the single most important finding to take away from this data.

Table 9. Mean Accuracy (and Standard Deviation) by Condition. Adapted from Lindsey et al. (2014).

	Set one	Set two	Set three
Experts	36.0% (23.2%)	66.2% (22.9%)	75.7% (22.6%)
Non-experts	39.0% (26.8%)	69.5% (23.3%)	81.0% (22.3%)

B. LIMITATIONS

The cultural and sociological differences amongst international military officers were not accounted for during this research project as compared to U.S. military officers in other studies such as Lindsey et al. (2014) and Lindsey et al. (2015) studies. The backgrounds of the participants in this research project differed greatly as they came from various national, regional, political, and religious influences. The ability to fully comprehend English was not accounted for in this research project, as participants were not gauged individually on their aptitude for understanding the questions presented to them during the survey; however, all participants were international military officers at NPS and had passed the Test of English as a Foreign Language (TOEFL) for admittance to their degree programs. The international military officers were also limited on the type of contextual questioning methods and scenarios. These scenarios were not a very good representation of what the international military officers were used to seeing or being exposed to in their normal military working environment. Despite this, detection accuracy improved greatly with the diagnostic utility of the questions. According to the NPS fact book (Naval Postgraduate School Annual Report and Fact book, 2015), as of peak quarter enrollment of summer 2015, there were 214 international military students on campus, yet this research received participation from 52 students. Although the sample size was small, proportionally, 24% is a good response rate for lab research.

C. RECOMMENDATIONS BASED ON ANALYSIS

Based on the results obtained, the authors recommend using the methodology to further extend and replicate results. By completing an additional iteration of this research, a better understanding of how content and contextual questioning methods aid deception detection could be possible. Due to regional, cultural, and ethnic limitations, and to the limited participation of international military officers, an additional replication of this research project among additional international military officers should be conducted to solidify these results. By replicating Study 1, the international military officer findings can be proven to be sound when compared to this research project and to Levine et al. (2014). The findings in this research project highlight non-experts are shown to perform

better than experts given questions based on content and contextual questioning methods. The authors recommend Study 1 could be furthered by taking those participants who achieved high scores and giving them additional training in deception detection. This training can range from diagnostic utility to understanding biases' interrogators bring into the interview room. By conducting this training for those who scored highest in Study 1, greater deception detection accuracy might be achieved. Once these participants have completed training, they should be given the same question sets to determine whether their accuracy rates improve.

The next chapter introduces the second study, which focuses on which specific factors people use, in addition to verbal and nonverbal indicators, when making judgments about deception.

VI. STUDY 2: BACKGROUND HISTORY / LITERATURE REVIEW

Study 2 is based on Park et al.'s (2002) qualitative research into how people detect lies and how long it takes lies to be discovered. Study 2 highlights the most used methods to detect lies. The participants in Study 2 were asked to tell how they were able to detect a lie within a workplace environment. This allows the information gathered to not be tainted by a laboratory setting. Furthermore, this line of questioning reveals verbal and nonverbal cues and leakage in lie detection. Since Park et al.'s (2002) research was based on earlier research focusing on verbal and nonverbal cues, Study 2 was designed to replicate the research methods used in Park et al. (2002) in order to obtain more data to support or refute its findings.

The idea of asking participants about deception detection in the workplace first appeared in Lindsey et al. (2011). Study 2 examines the relational aspects of deception detection, including the power dynamics of supervisors and subordinates. Study 2 delves into how subordinates lie to supervisors and how supervisors lie to subordinates. Lindsey et al. found "no lies were uncovered through the interpretation of nonverbal cues, rather they were discovered after the fact through evidence or confessions" (Lindsey et al., 2011, p. 74). This could be through third-party information, physical information, or a combination of multiple factors. Ultimately, verbal or nonverbal cues were not noticed at the time of the deception. Lindsey et al. (2015) replicated Lindsey et al. (2011), and the results implied the workplace environment has influencing factors in the attempt to replicate Study 2 within a highly charged military culture. "Both power and stakes are greatly increased because of the effects of after-the-fact evidence and a complete disregard for nonverbal variables" (Lindsey et al., 2015, p. 27).

Park et al. (2002) helped shed light on how people detect deception, but it also made arguments as to what was wrong with the resounding research into verbal and nonverbal cues in deception. Park et al. (2002) listed faults of prior studies into verbal and nonverbal cues:

- judges in deception detection experiments did not know deception detection accuracy would be higher if subjects had idiosyncratic knowledge of the deceiver,
- studies were done under everyday conditions and not under high-stakes conditions,
- the researcher either encouraged or sanctioned lies and,
- the participants did not normally interact on a one-on-one basis.

When conducting research into deception detection, researchers must be careful to factor in these potentially limiting influences in order to get quality results.

A. RESEARCH QUESTION

This research project and the previous research efforts are an extension and replication of Park et al.'s (2002) and Lindsey et al.'s (2015) research. The goal of the Study 2 is to determine if Park et al.'s (2002) and Lindsey et al.'s (2015), results are applicable on a broader scale other than college students and law enforcement officers.

Applying the methods used by Park et al. (2002), the authors seek to determine what type of information international military officers report using when detecting lies in non-research settings? The authors expect to collect data which should be indicative of previous data collected by Park et al. (2002). This data should indicate most participants found incriminating information after the fact, which led to the detection of deception. This would validate Park et al.'s (2002) argument that verbal and nonverbal cues are not heavily relied upon as suggested by other research.

VII. STUDY 2: METHODOLOGY

This study is a replication of previous work and a follow-on to Lindsey et al. (2015) designed to increase sample sizes, in order to allow for statistically valid conclusions. Because the current study collected participant data in an identical manner to Lindsey et al. (2015) and because study methodology must be reported precisely and specifically, this chapter presents the same methodological information as Lindsey et al. (2015) adapted and updated to reflect the current study's specific participant data:

> The authors sought approval from the NPS IRB for the Protection of Human Subjects prior to conducting Study 2. The IRB granted approval for completing Study 2 after the authors completed IRB mandated training. Upon initiating Study 2, the authors replicated Park et al. (2002), study in a controlled academic setting wherein volunteers filled out questionnaires to measure their perceptions about others' communication through questionnaires. The questionnaires were maintained through positive control measures, which ensured that all responses given were kept anonymous and could not be linked to the participants' identities. The questionnaires did not elicit any PII and only contained basic demographic information about the participants. Upon the completion of Study 2, two trained coders coded all completed questionnaires independently. The coding observed in Park et al. (2002), study was replicated in Study 2, in which inter-coder reliability (Kappa) was calculated and all disagreements between coders were resolved through discussion between the coders. (Lindsey et al, 2015, p. 29)

A. PARTICIPANTS

The participants in Study 2 volunteered their time and effort without any pressure, coercion, or unlawful inducement. Participants were not awarded anything of value by providing their judgments or experiences. The sample for Study 2 included the same participants as Study 1. The participants were 52 international military officers who represented 23 countries and were actively enrolled as students at NPS.

B. PROCEDURE

The procedures followed were identical to the procedures used by Lindsey et al. (2015): In Study 2, adapted from Park et al. (2002), participants were specifically "asked

to recall a recent situation in which they had discovered that someone had lied to them. They were instructed to take time and recall as much information as they could about what happened" (p. 149), in order to provide as much detail as possible. Then participants were asked a series of questions (See Appendix), obtained from the protocol used in Park et al. (2002). (Lindsey et al., 2015, pp. 29-30)

> The participants were asked the following, specific, questions on how and when the deception took place from Park et al. (2002):
>
> 1. Recall as much as you can about the situation in which the person originally lied to you. In as much detail as possible, describe the event where you were lied to: Where did it happen? What was the lie about? If you can, be sure to write down the exact thing that the person said to you.
> 2. How long ago did this event (the lie) originally take place?
> 3. What was/is the relationship between you and the person who lied to you?
> 4. Now, think about how you found out that the person lied to you. Describe in as much detail as you can the events surrounding your discovery of the lie: How exactly did you find out that the person lied to you?

C. CODING OF QUALITATIVE DATA

The qualitative data obtained in Study 2 was coded into four separate categories:

- How long ago did this situation take place,
- the relationship between the participant and the deceptive subject,
- the discovery method used in detecting the deception, and
- the time-lapse between when the lie was told and when the participant found out about the lie.

For the query about how long ago the person lied initially, the data were standardized into months. The time ranged from 0.033 months (1 day) to 84 months (7 years). The coding options for the relationship between the participant and the deceptive individual were adapted from Lindsey et al. (2015) which included the following categories: none, superior/immediate boss, "superior/above immediate boss, subordinate, child, spouse, immediate family member (brother, sister, mom, dad)" (p. 30), peer/friend,

teacher/caregiver, senior in rank/but no command relationship, stranger, customer, or investigator. The coding options for the discovery method were adapted from Lindsey et al. (2015), which were based on the following options: none, “3rd party information, physical information, solicited direct confession, unsolicited direct confession, at-the-time verbal and/or nonverbal behavior, inconsistencies with prior knowledge, combination (two or more listed above)” (p. 30), assumption, investigation (acts to confirm a suspicion or accusation, different from “combination”), and suspicion. The coding options to determine the lapsed time from when the lie was told and the participant found out were adapted from Lindsey et al. (2015) which were classified as the following: none (if there was no positive answer provided), “immediate detection, less than one hour, less than one day, less than one week, less than one month, less than one year, more than one year” (pp. 30-31). The results section of this chapter contains further information on the usage of data collected.

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VIII. STUDY 2: RESULTS

This study is a replication of previous work and a follow-on to Lindsey et al. (2015). The statistical analyses required to answer the current research questions are identical to Lindsey et al. (2015). Because statistical analyses are very specific and must be reported with precision, this chapter presents the same statistical analytic information as Lindsey et al. (2015), replicated and updated to reflect the current study's data and results:

> Frequency data show the most common discovery methods were third-party information [31.0%] and physical information [20.7%]. The least common valid discovery methods were unsolicited direct confession [3.4%] and inconsistencies with prior knowledge [6.9%]. Table 10 delineates these findings while Table 11 presents examples of the discovery methods (Lindsey et al., 2015, p. 33).

Table 10. Frequency of Recalled Workplace Lie Discovery Methods. Adapted from Lindsey et al. (2015).

Discovery Method	*f*	%
Third Party Information	9	31.0%
Physical Information	6	20.7%
Verbal/Nonverbal Behavior	5	17.2%
Combination	4	13.8%
Inconsistencies with Prior Knowledge	2	6.9%
Other	2	6.9%
Unsolicited Direct Confession	1	3.4%
Solicited Direct Confession	0	0.0%
Total	29	100

Table 11. Examples of Discovery Method Categories. Source: Lindsey et al. (2015, p. 34).

DISCOVERY METHOD	Response Example
Third-party Information	A colleauge [sic] lied about getting married to a local woman while on an operation in the Balkans. His new spouse told me, in confidence, that they were married.
Physical Information	Going further into the investigation, the scanner in question was found at the individual's residence.
Unsolicited Direct Confession	One sailor failed to show up for work because he said his mother was sick. After expressing verbally that I would help him get his mother help on several occasions, he finally told me that his mother was not sick and [he] was late to work because he had not awakended [sic] after a long party.
Verbal/Nonverbal Behavior	They kept looking the other way, being very unsettled during the questioning.
Inconsistencies with Knowledge	I told a colleauge [sic] about my trip to San Diego. He told me he had went to San Diego two weeks before and went to Sea World. Two weeks later he asked me how long of a drive it was from San Diego, in which he said that he had not been to San Diego before.
Combination	A subordinate didn't come back from leave on time because he said he broke his hand. I checked his Facebook page, talked to his friends, and spoke with his friends [sic] doctor, which proved.

The second half of the questionnaire addresses how many months it had been since the respondent was lied to. The time that had lapsed ranged from 0 months (immediate) to 180 months (15 years), with the average being 22.84 months (SD=42.85).

The relationship between the liar and the participant was analyzed for correlation as provided in Table 12. Results showed most deceptions occurred between participants and their subordinates (44.8%).

Table 12. Frequencies of Participant-Deceiver Relationship

Relationship	***f***	**%**
Subordinate	13	44.8
Peer/Friend	9	31
Other	3	10.3
Teacher	2	6.9
Superior/Immediate Boss	1	3.4
Senior in Rank, but No Command Relationship	1	3.4
Total	29	100

The final question focused on how much time had passed between the telling of the lie and when it was finally discovered. In 17 (58.6%) cases, either participants did not provide a response or the response given was ambiguous and could not be accurately evaluated. Seven (24.1%) were immediate, in-the-moment judgments, four (13.8%) were detected in less than one day, and one (3.4%) was detected in less than one month.

In the military, discipline is held in high esteem therefore repercussions are expected if an individual is caught lying, especially if the lie is to a superior. Park et al. supports this by stating "…it can be argued that accuracy should be higher for high stakes lies because there should be more nonverbal leakage when the stakes are high" (Park et al., 2002, p. 146). The results of Study 2 are discussed next in Chapter IX.

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IX. STUDY 2: DISCUSSION, FINDINGS, LIMITATIONS AND RECOMMENDATIONS BASED ON ANALYSIS

Study 2 revealed international military officers detected deception first by relying on third party information (31.0%), next by relying on physical information (20.7%), and then by verbal and nonverbal behavior (17.2%) as illustrated in Table 10. These findings are noteworthy in the fact international military officers were consistent with relying on third party information followed by physical information, but they had a higher than normal reliance on verbal and nonverbal behavior, when compared to the findings of previous research.

A. DISCUSSION AND FINDINGS

Consistent with Park et al. (2002), Lindsey et al. (2014), and Lindsey et al. (2015), international military officers relied on third party and physical information to detect deception. Differences between the current findings and previous studies exist, however. Table 15 shows the percentages for the same categories for Park et al. (2002), Lindsey et al. (2014) and Study 2.

Table 13. Frequencies of Recalled Lie Discovery Methods. Adapted from Park et al. (2002).

Discovery Method	*f*	%
Third Party Information	62	32.0%
Combination	60	30.9%
Physical Information	35	18.0%
Unsolicited Direct Confession	16	8.2%
Solicited Direct Confession	7	3.6%
Verbal/Nonverbal Behavior	4	2.1%
Inconsistencies with Prior Knowledge	4	2.1%
Inadvertent Confession	4	2.1%
Other	2	1.0%
Total	194	100

Table 14. Frequencies of Recalled Lie Discovery Methods Study 2. Adapted from Park et al. (2002).

Discovery Method	*f*	%
Third Party Information	9	31.0%
Physical Information	6	20.7%
Verbal/Nonverbal Behavior	5	17.2%
Combination	4	13.8%
Inconsistencies with Prior Knowledge	2	6.9%
Other	2	6.9%
Unsolicited Direct Confession	1	3.4%
Solicited Direct Confession	0	0.0%
Total	29	100

Table 15. Comparison Data for All Studies

Method	Park et al. (2002)		Lindsey et al. (2014)		Buckley and Franz (2016)	
Discovery Method	*f*	%	*f*	%	*f*	%
Third Party Information	62	32.0%	14	16.9%	9	31.0%
Physical Information	35	18.0%	12	14.5%	6	22.7%
Verbal/Nonverbal Behavior	4	2.1%	0	0.0%	5	17.2%
Two or more (combination)	60	30.9%	9	10.8%	4	13.8%
Inconstant with Prior Knowledge	4	2.1%	5	6.0%	2	6.9%
Unsolicited Direct Confessions	16	18.2%	4	4.8%	1	3.4%
Solicited Direct Confessions	7	3.6%	2	2.4%	0	0.0%
Inadvertent Confession	4	2.1%	0	0.0%	0	0.0%
Other	2	1.0%	1	1.2%	2	6.9%
None Listed	0	0.0%	36	43.4	0	0.0%
Totals	194	100	47	100	29	100

The most noteworthy data in Table 15 indicate that verbal/nonverbal behavior was a significant factor used by participants when they perceived that they had been lied to in the past. Verbal and nonverbal behavior was used amongst 17% of respondents in this study compared to 0% in Lindsey et al. (2014), and 2.1% in studies conducted by

Park et al. (2002). Also this current study indicates that only 13.8% of respondents used a combination of indicators which closely mimics the 10.8% observed in Lindsey et al.'s (2015) study, but less than half of the 30.9% observed by Park et al. (2002). Another significant inconsistency observed in this current study when compared to Park et al.'s (2002) study is that unsolicited direct confessions were obtained by 18.2% of Park et al.'s (2002) respondents, versus 3.4% observed in this current study and 4.8% in Lindsey et al. (2015).

B. LIMITATIONS

Only 56% of the participants from Study 1 completed Study 2. The authors believe, although no data are available to support this assumption, international military officers might have had difficulty answering some of these questions due to English being their secondary language. The open-ended nature of the questions may have led to a lower participation rate.

C. RECOMMENDATIONS BASED ON ANALYSIS

Replication of Study 2 could be enhanced by changing the data collection method from a self-report survey to having participants answer the same questions in an interview setting. This would aid the study two-fold; first it would get a higher response rate since the participants would feel more comfortable and secondly, by employing this method, the data collectors could get more specific data points. By using an interview setting, the authors believe a higher response rate would be achieved.

As the authors were performing the qualitative coding, they had to read the entire content of the answers together to properly code each response. If the data collectors were conducting an interview, they would be able to clarify answers to specifically meet the question without ambiguity. This would lead to a more accurate picture of how international military officers detect lies.

Chapter X discusses the overall summary, recommendation for further research and conclusions.

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X. OVERALL SUMMARY, RECOMMENDATION FOR FURTHER RESEARCH AND CONCLUSIONS

This project was effective in replicating findings similar to Levine et al.'s (2014) study through the use of diagnostic utility and cue-based deception detection, and in Park et al.'s (2002) study on how people actually detect lies. Furthermore, this project successfully extended those findings of Lindsey et al. (2015) to international military officers stationed at the NPS. Overall, the authors believe this research could be replicated with additional populations and yield consistent results to the current research and Levine et al. (2014). The studies reported in this project, along with Park et al. (2002), Levine et al. (2014), and Lindsey et al. (2014), demonstrated using both quantitative and qualitative methods, deception can be detected accurately, but not in the typical ways decades of prior research suggested.

A. SUMMARY

The intent of this research project was to replicate both Levine et al.'s (2014) diagnostic utility methodology and Park et al.'s (2002) method for learning how people detect every-day lies. The authors sought to extend previous research by focusing on a diverse subset of the NPS international military population. The authors aimed to understand how people detect lies and how to improve deception detection rates from the long-time plateaued, barely-better-than-chance average of 54%. Future research should continue to replicate and extend these methods to various populations such as specific international military officers categorized by regions, or even international military officers who specialize in counter intelligence or interrogations. From these studies, the United States could gain insight into how other countries detect lies. This would aid U.S. and international relations, especially within joint military billets. This would also help with defector interrogations and counter intelligence settings. This research project, as well as previous efforts by other researchers, indicates utilizing contextual questioning methods is superior to reliance on other traditional methods used in detecting deception, such as nonverbal cues.

Study 1 replicated Levine et al.'s (2014) diagnostic utility research. Results revealed employing diagnostic utility and contextual cues can replicate significantly increased deception detection accuracy as observed with the current international military officer sample. Although the sample is small (N = 52) by traditional measures, is a good representation of the international military population at NPS, specifically. The results of Study 1 showed deception detection accuracy increased as the question sets incorporated more content and contextual questioning methods. Study 1 also incorporated the expertise of the participants, as they self-assessed themselves as experts or non-experts as well as indicated whether they received formal training. Study 1 further indicated experts performed better than non-experts (73.3% versus 66.2% in question set 3) yet those who had received no formal training performed better than those who had (69.2 versus 65.4% in question set 3). The sample used in this study was not large enough to allow comparisons which would discern whether international military officers from a particular region, nation, or cultural background had performed better than others. Specific cultural, regional, linguistic or political backgrounds might impact the efficacy of content and contextual questioning methods for increasing detecting deception accuracy, but this is an empirical question the current study could not answer. The results of Study 1 were not based on experience or training, as the findings resulted in more questions than answers in terms of how experts performed better than non-experts yet those without formal training outperformed those with formal training. The results here indicate training and experience might have less of an impact on deception detection accuracy than diagnostic utility and content and contextual questioning methods.

Study 1 provided results based on a quantitative replication methodology from Levine et al.'s (2014) research. Study 1 revealed the use of diagnostic utility and judgment can be replicated as observed with the sample of (N=52) international military officers. While the sample seems quite small (N=52), this is a good representation of the international military population at NPS. The results of Study 1 proved deception detection accuracy increased as the question sets incorporated more content and contextual questioning methods. Study 1 also incorporated the expertise of the participants, as they identified themselves as experts or non-experts and indicated

whether they had received formal training. Study 1 further indicated experts performed better than non-experts (73.3% versus 66.2% in question set 3) yet those who received no formal training performed better than those who received formal training (69.2 versus 65.4% in question set 3). The sample used in Study 2 was not large enough to discern whether international military officers from a particular region, nation, or cultural background had performed better than others. It is possible international military officers from a specific cultural, regional, or political background could be better at detecting deception than others. This should be researched further using the methodology from Levine et al. (2014). The results of Study 1 were not based on experience or training. The results show deception detection accuracy is not based on training, but, instead, it is based on diagnostic utility and how content and contextual questioning methods are used.

Study 2 replicated research by Park et al. (2002) to determine how international military officers detect lies in their daily work routine, and distinguish if these results would mirror Park et al.'s findings. The results of Study 2 showed international military officers produced comparable findings to those of Park et al. (2002) and Lindsey et al. (2014). Similarities were found in the two most common methods for detecting deception in the workplace: third party information and physical information. Also, an unexpected and interesting finding from Study 2 was verbal and nonverbal cues were the third highest discovery method at 17.2% compared to previous studies showing only 2.1% (Park et al., 2002) and 0.0% (Lindsey et al., 2014). The discoveries made in Study 2 aid in better understanding the interactions and dynamics which might be different in international workplace settings.

B. RECOMMENDATIONS FOR FURTHER RESEARCH

During this research project, several notable findings were brought forward in regard to the advancement of deception detection research. Study 1 placed a connection between deception detection rates and diagnostic utility. Even though Study 1 made that connection it is the author's recommendation further replication of this study should be conducted to get more robust numbers. This is the only way the deception detection community can start to see this line of questioning as the new wave for accuracy. Study 1

brought up some interesting results including international military officers with no formal training outperforming those with formal training. This not only goes against conventional wisdom, but also shows accuracy is based more on the content of the questions the interrogator asks. The authors recommend further study into how training or lack of training, impacts deception detection accuracy. This recommendation would lend credence to the notion of diagnostic utility, if training is shown to have a minimal impact on accuracy. Additional research should seek to determine if there is any impact regarding the participants with no formal training (as they do not carry biases into the interrogation room). Study 1 would further benefit from more research into the theories of truth biases, honesty effect, and probing effects. This may help explain how training can aid or hinder deception detection.

In addition, the authors would also like to research specialties in the military which provide training and education on how to detect deception. It would be interesting to investigate the quality and breadth of the training international military officers receive. The training international military officers receive may differ in quality compared to the training received by U.S. military officers. This could be an additional research topic for further study. It is also recommended during Study 1, participants should have indicated how they came up with their assessment of how they determined who was an “honest non-cheater” and who “cheated and lying about it.” This way the data collectors could see how the participants came to their assessment. The data collector could also use this data to identify whether the participant received effective training as well as whether the formal training was a hindrance or a benefit for their deception detection accuracy.

Study 2 showed how people detected lies but it also showed how few participants answered the questions accurately or at all. Finding out how people detect lies is core to this study, and without good data, reliable conclusions cannot be formulated. The overall response rate of 77.7% is not bad, but the goal would be to get it as close to 100% as possible. The authors recommend replication of this study with the added process of sitting down with the participants and asking them the questions on the survey to make the participants feel more comfortable, to resolve any issues in communication (based on

language barriers), and to further clarify any answers provided by the participant. In doing this, the data collectors will be able to get better qualitative and quantitative data.

The authors identified a possible area of continued research into international military officers by region, nation, or cultural background. Since this project did not collect data on these categories it would be interesting to see if one particular region detects lies more accurately then others. If this is a finding, further research would be needed to isolate the reasons the sample used in this study was not large enough to allow comparisons which would discern whether international military officers from a particular region, nation, or cultural background performed better than others. Specific cultural, regional, linguistic or political backgrounds might impact the efficacy of content and contextual questioning methods for increasing detecting deception accuracy, but this is an empirical question which the current study could not answer.

Limitations in the research project were mainly two-fold: recruitment and low participation in Study 2. Recruiting international military officers to participate in this research project proved difficult. This may have been due to a stringent course load at NPS or possibly feeling like they wouldn't bring any new information to the table. The authors reached out to the Director of the International Graduate Programs Office to aid in recruitment. It is recommended for further replication of this research project to have a very robust recruitment strategy and contacts within the International Graduate Programs Office before implementation. Additionally, performing liaison as well as coordinating with the International Graduate Programs Office on events which specifically target international military officers would increase the recruitment and participation of international military officers. As for low participation in Study 2, the authors previously recommended implementing an interview portion would yield better numbers for analysis.

C. CONCLUSIONS

This research project replicated the finding of Levine et al. (2014) and Park et al. (2002), through diagnostic utility using content and contextual questioning methods and quantitative analysis in Study 1, this research project yielded a higher deception detection rate than the Bond and DePaulo (2006) meta-analysis rate of 54%. Qualitatively, the

authors found international military officers relied on third party and physical information as opposed to relying on verbal and nonverbal indicators. Additionally, this research project has highlighted experts perform better using diagnostic utility questioning methods over non-experts. Finally, this research project found participants with no training consistently outperformed participants with training. Further research is needed to explain why this occurred.

APPENDIX. CONSENT FORM AND QUESTIONNAIRE

The following consent form was taken directly from and used in the extension and replication of the research conducted by Lindsey et al. (2015).

Consent Form

You are invited to participate in a research study to measure your perceptions about others' communication. The purpose of the research is to better understand how people's perceptions of communication impact their judgments. Your participation should take about 30 minutes to complete.

You will be asked to watch short video clips, make judgments about each clip, and complete a survey about past experiences you have had with similar communication situations.

Your participation is voluntary. If you participate, you are free to skip any questions or stop participating at any time [sic] without penalty. The alternative to participating in the research is to not participate.

Your responses are anonymous and will not be linked to your identity in any way. No personally-identifying information will be collected—the survey only asks for broad demographic information and no other identifiers from participants.

The anticipated benefit from this study is that the findings will contribute to a larger body of knowledge, and they will be used to inform coursework at NPS. You will not directly benefit from your participation in this research.

There are no known or anticipated risks associated with participation.

Results of the survey will be used responsibly and protected against release to unauthorized persons; however, there is a minor risk that data collected could be mismanaged. Only the researchers will have access to the data which will be stored on a password-protected computer.

If you have questions regarding the research, or if you experience any injury or discomfort, contact Dr. Lisa Lindsey, LLindsey@nps.edu, Principal-Investigator. If you have any questions regarding your rights as a research subject, please contact the Naval Postgraduate School IRB Chair, Dr. Larry Shattuck, 831.656.2473, lgshattu@nps.edu.

Statement of Consent. I have read the information provided above. I have been given the opportunity to ask questions and all the questions have been answered to my satisfaction. I agree to participate in this study. I understand that by agreeing to participate in this research and checking the box below, I do not waive any of my legal rights.

☐ I consent to participate in the research study.

☐ I do not consent to participate in the research study.

You will see three sets of videotaped interviews. The basic situation is always the same, but the interviewer, the person interviewed, and the questions are different.

Background: These clips are of interviews with college students who participated in a study about teamwork. Each subject had just played a trivia game with a partner for a cash prize. All participants were given an opportunity to cheat when the experimenter was called out of the room, and the answers were left in a folder within easy reach of the participants. Some participants cheated and others did not. All the people being interviewed on these tapes denied cheating.

Instructions: Watch each interview and decided if you think they cheated or not. For each interview, circle an answer indicating your opinion about whether you think that they were honest and did not cheat or that they really did cheat and are lying about not cheating.

Set 1 Video: Exline1_4clips (6 min.)

Number	Interview	Judgment (circle one)	
1	39	Honest non-cheater	Cheated and lying about it
2	45	Honest non-cheater	Cheated and lying about it
3	44	Honest non-cheater	Cheated and lying about it
4	54	Honest non-cheater	Cheated and lying about it

Set 2 Video: Exline2_4clips (11 min)

Number	Interview	Judgment (circle one)	
5	54	Honest non-cheater	Cheated and lying about it
6	57	Honest non-cheater	Cheated and lying about it
7	71	Honest non-cheater	Cheated and lying about it
8	72	Honest non-cheater	Cheated and lying about it

Set 3 Video: Exline4_4clips (12 min)

Number	Interview	Judgment (circle one)	
9	25	Honest non-cheater	Cheated and lying about it
10	18	Honest non-cheater	Cheated and lying about it
11	10	Honest non-cheater	Cheated and lying about it
12	12	Honest non-cheater	Cheated and lying about it

*Finally, we'd like for you to recall a recent **work-related** situation in which you discovered that someone lied to you. Please take a moment to think of an example and remember as much as you can about what happened. Keeping this situation in mind, please answer the following questions:*

1. Recall as much as you can about the situation in which the person originally lied to you. In as much detail as possible, describe the event where you were lied to: Where did it happen? What was the lie about? If you can, be sure to write down the exact thing that the person said to you.

2. How long ago did this event (the lie) originally take place?

3. What was/is the relationship between you and the person who lied to you?

4. Now, think about how you found out that the person lied to you. Describe in as much detail as you can the events surrounding your discovery of the lie: How exactly did you find out that the person lied to you?

Please tell us about yourself (circle the correct answer or fill in the blank):
Sex: Male Female Age: _____ Years of Military Service: _____
Rank: _____ Branch (circle one): Army Navy Air Force Marines
Have you ever received formal interviewing or interrogation training? No Yes
Have you ever conducted interviewing or interrogation as a regular part of your job? No Yes
Are you: U.S. Military International Military (please specify country) _____
Race/Ethnicity: Caucasian/White
African American/Black
Asian/Pacific Islander
Hispanic/Latino(a)
American Indian
Alaskan or Hawaiian Native
Other (please specify) _____

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